An Overview of Natural Gas in California

California Energy Commission

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One in eight Americans, or more than 37 million people, lives in California. Fueled by this growing population, the demand for natural gas in California is increasing.

Natural gas is essential to California's energy system and provides more than a third of the state's total energy requirement.

About 44 percent of the natural gas consumed in our state is used to generate electricity, and natural gas is the primary fuel for residential cooking, space and water heating, and industrial processes.

Almost 30 years ago, California's serious air quality problems placed natural gas as the fuel of choice for electricity generation. In the late 1970s and early 1980s, for air quality and cost benefits, California moved away from petroleum to natural gas for generating electricity. Natural gas was cleaner-burning, relatively cheap, and helped diversify the state's electricity generation system. Now, with global warming recognized as a serious world environmental concern, the rest of the United States, Canada, and Mexico are following California's lead with a similar shift from an oil- and coal-based electricity system.

Today, California faces a new challenge. Burning natural gas contributes to greenhouse gas emissions, and state law mandates that California's greenhouse gas emissions be reduced to 1990 levels by 2020. This reduction must be balanced with the understanding that natural gas is the fossil fuel of choice and will likely play an even more important role in California's energy future, despite policy makers' emphasis on efficiency and renewables.

This booklet presents an overview of California's natural gas system. At the end of this document, is a listing of California and federal agencies involved with energy and natural gas.

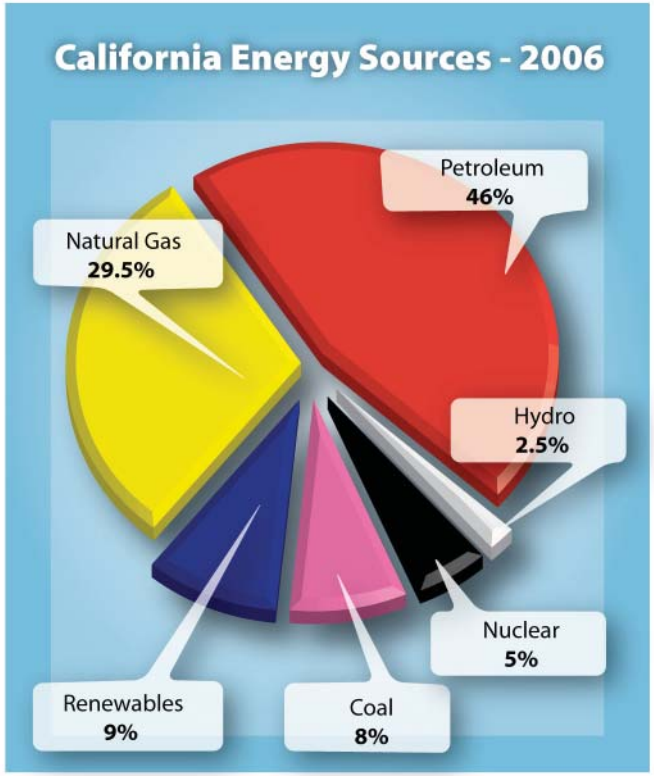
For more information, please visit the California Energy Commission's website at:

www.energy.ca.gov

On the cover: Photo of natural gas flame from iStockphoto.

California's Energy Sources

California enjoys a diverse energy resource mixture, with two primary fuels: petroleum makes up nearly half of all the energy used in our state–mostly for transportation–with natural gas providing about 30 percent.

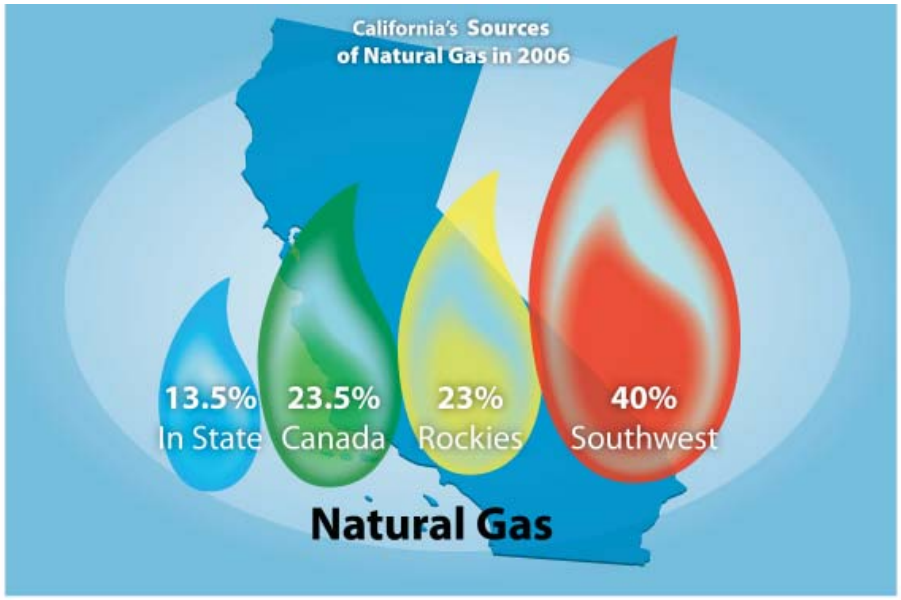


Source: California Energy Commission

Natural gas will continue to be a major fuel in California's supply portfolio, though our state's production has been declining. In 1980, state sources of natural gas totalled 1,243 million cubic feet per day (MMcfd), out of a total of 5,235 MMcfd, or roughly 24 percent. Peak production in the state was in 1987 at 1,951 MMcfd, out of a total of 5,943 MMcfd, or almost 33 percent. The amount produced in state from both on- and off-shore production has continued to decline. In 2006, in-state production of natural gas had dropped to 852 MMcfd, out of a total of 6,316 MMcfd, or about 13.5 percent.

Sources of Natural Gas

California's supplies of natural gas come from four areas: in-state production, Southwestern United States, Canada, and the Rocky Mountain Region.



Source: California Energy Commission

In 2006, more than 85 percent of California's natural gas supplies was from sources outside the state. This dependency poses an ongoing challenge in securing adequate and reliable supplies of natural gas at reasonable prices. This occurs, in part, because natural gas well productivity in the United States is declining, and California is literally at the end of the interstate pipeline system, competing with growing North American demand.

Natural gas demand in the power generation sector for the United States is projected to increase by 5.5 percent per year, putting pressure on California's ability to obtain stable supplies without paying more. Most of this projected growth is occurring in the states east of the Mississippi as they shift from coal-based electricity generation to cleaner natural gas-fired generation to help reduce criteria pollutant emissions.

Natural gas from out-of-state production basins is delivered into California via the interstate natural gas pipeline system. The five major interstate pipelines that deliver out-of-state natural gas to California consumers are the Gas Transmission Northwest Pipeline, Kern River Pipeline, Transwestern Pipeline, El Paso Pipeline, and Mojave Pipeline. (Another pipeline, the North Baja Pipeline, takes gas off the El Paso Pipeline at the California/Arizona border, and delivers that gas through California into Mexico.)

Source: California Energy Commission

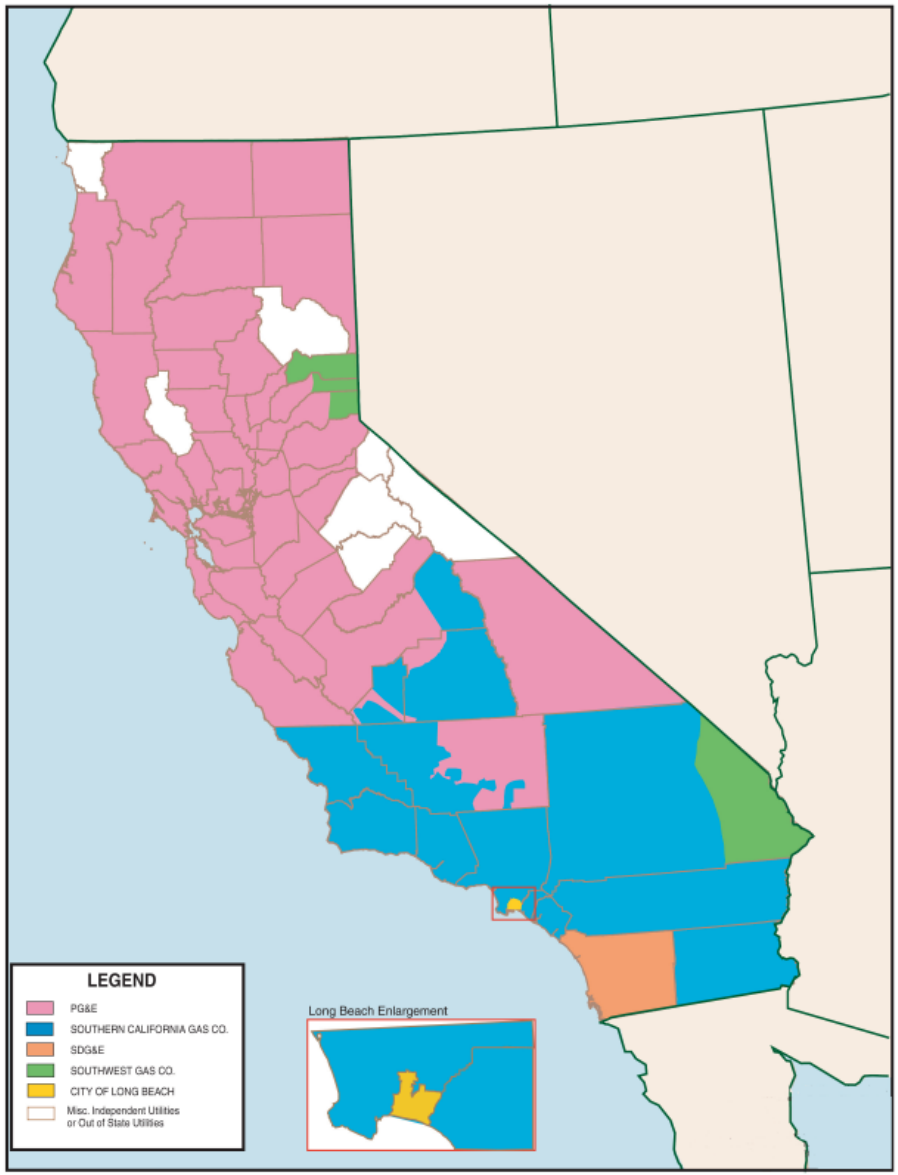
Market Share By Pipeline Capacity Owner in 2004

Company	Market Share	Capacity (MMcf)
Sempra	20.7%	1,721
PG&E	11.6%	964
Southwest Gas Corp.	5.9%	491
Chevron	4.2%	347
Reliant Energy	3.6%	300
BP	3.5%	289
Calpine Corp.	3.3%	277
Sierra Pacific Resources	3.2%	266
Duke Energy Corp.	3.0%	251
Shell	2.1%	174
Total	**61.1%**	**5,080**

Source: FERC, *2004 State of the Market Reports from Natural Gas Situations and Prices Report*, June 2005 - Staff Report by the Office of Market Oversight and Investigation, p. 199.

Once natural gas arrives in California, it is distributed by the natural gas utility companies. The three major utilities – Southern California Gas Company, San Diego Gas & Electric, and Pacific Gas and Electric Company – collectively serve 98 percent of the state's natural gas customers. The remaining 2 percent are served by municipal and smaller or out-of-state investor-owned utilities.

California Natural Gas Utility Companies' Service Territories



Natural Gas Demand

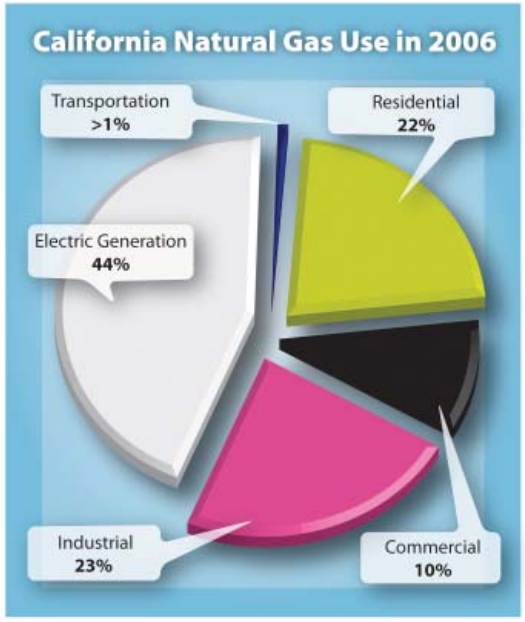
California's natural gas demand is about 6 million cubic feet per day (6,032 MMcfd). Total demand for a year is 2.19 billion cubic feet.

2006 California Natural Gas Demand by Service Area

	Million Cubic Feet/Day
PG&E	1,968
SoCal Gas	2,246
SDG&E	328
Net Storage/Loss	129
Nonutility	1,361
State Total	**6,032**

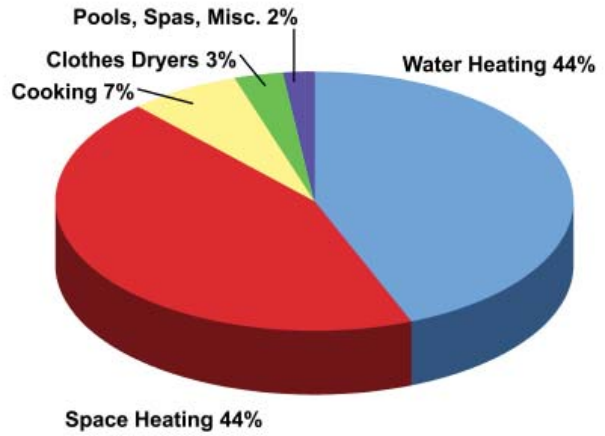
About 11 million customers receive natural gas in California. The vast majority of California's natural gas customers are residential and small commercial customers, referred to as "core" customers, who accounted for approximately 43% of the natural gas delivered by California utilities in 2005. Large consumers, like electric generators and industrial customers, referred to as "noncore" customers, accounted for approximately 57% of the natural gas delivered by California utilities in 2005.

The largest user of natural gas is electrical generation, using about 44 percent of all natural gas in the state.



Source: Utility and pipeline filings with the California Energy Commission

Residential Natural Gas Use in California



The residential sector uses 22 percent of the natural gas. Of that amount, 88 percent is used by space and water heating in our homes.

Since 1970, the number of households in California has almost doubled from 6.5 million to 12.5 million, pushing total residential consumption up from about 6,5000 million therms in 1970 to about 6,700 milllion in 2007.

However, the average gas consumption per household has dropped more than 36 percent, from 845 therms to 538 therms as a result of California's building and appliance efficiency standards.

Natural Gas Costs and Prices

Californians spent nearly $19 billion on natural gas in 2006, with 42% for core customers (residential and commercial), 40% by non-core (industrial and electricity production), and 18 percent by non-utility (direct deliveries from interstate pipelines and California production). That's a near-tripling of the costs in ten years.

Summary of California Natural Gas Costs

(Millions of Dollars)

	Core	Noncore	Nonutility	Total
1996	3,906	2,188	691	6,785
1997	4,183	2,781	859	7,822
1998	4,680	2,565	838	8,083
1999	4,674	3,039	923	8,636
2000	5,435	8,566	2,263	16,264
2001	6,807	9,789	2,820	19,416
2002	4,744	3,988	1,080	9,812
2003	5,917	5,969	2,271	14,157
2004	6,862	6,888	2,733	16,483
2005	7,992	8,591	3,588	20,171
2006	7,941	7,556	3,353	18,850

Source: California Energy Commission, based on Utility Annual Reports

Notes:

"Core" is utility deliveries to residential and commercial sectors.

"Noncore" is utility delivieries to industrial and electric generation.

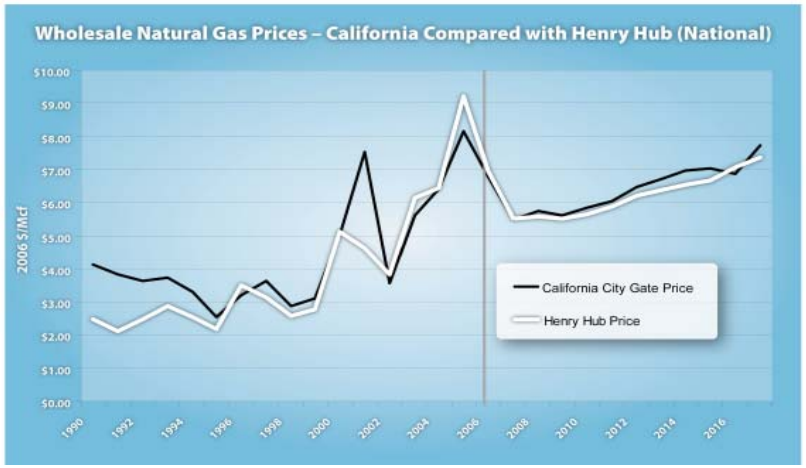
"Nonutility" is direct deliveries from interstate pipelines and California production.

California Natural Gas Residential Prices, 1970-2007

(Dollars per Thousand Cubic Feet)

1970	$0.99
1971	1.03
1972	1.08
1973	1.16
1974	1.38
1975	1.57
1976	1.77
1977	1.89
1978	1.99
1979	2.47
1980	$3.51
1981	3.74
1982	4.43
1983	5.41
1984	5.84
1985	5.72
1986	5.14
1987	5.26
1988	5.64
1989	5.59
1990	$5.78
1991	6.27
1992	5.97
1993	6.23
1994	6.39
1995	6.42
1996	6.44
1997	6.81
1998	6.92
1999	6.62
2000	$8.21
2001	10.43
2002	7.11
2003	9.13
2004	9.86
2005	11.85
2006	11.79
2007	11.55

Source:
U.S. Energy Information Administration,
http://tonto.eia.doe.gov/dnav/ng/hist/n3010ca3a.htm



Source: California Energy Commission

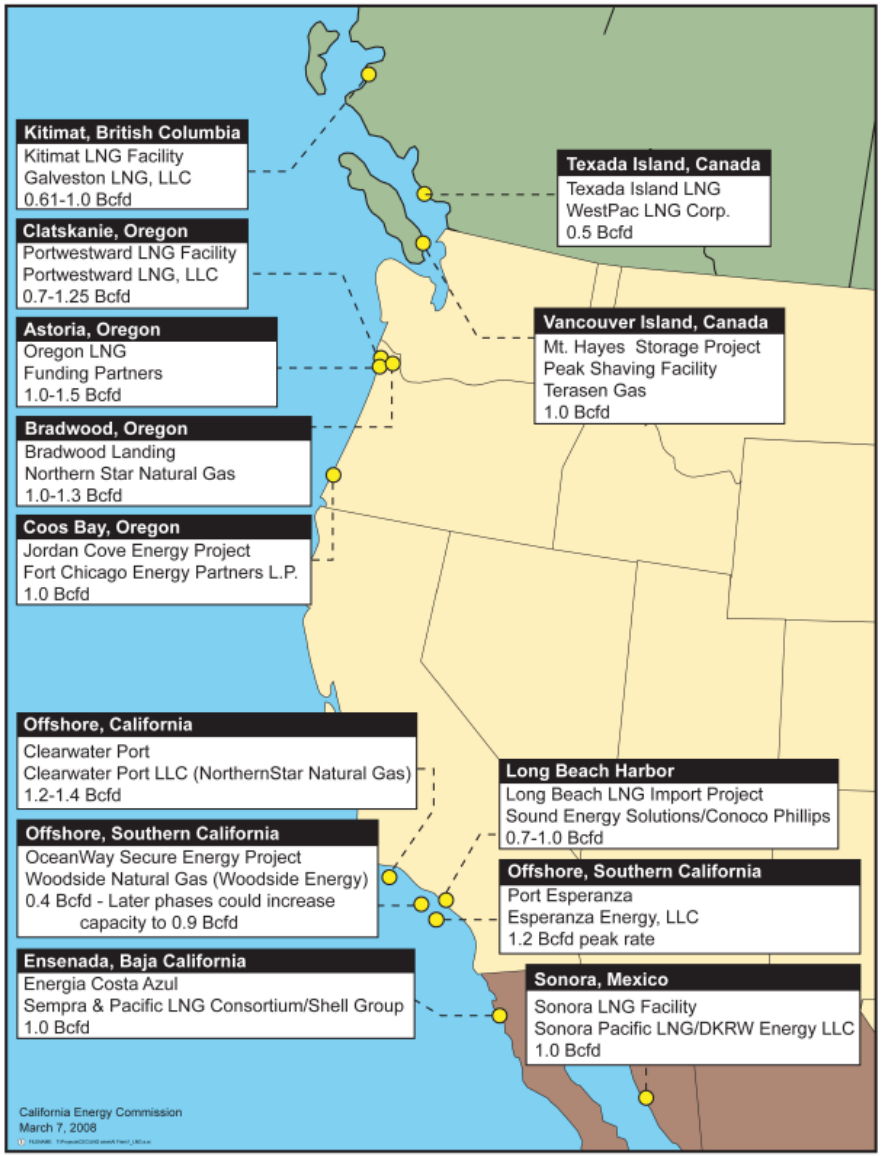
Future Demand and LNG

Natural gas has become an increasingly important source of energy since more of the state's power plants rely on this fuel. While California's successful efficiency programs and its reliance on renewable sources of electricity should slow the demand for natural gas, competition for the state's imported supply is increasing. Our reliance on imported gas leaves the state vulnerable to price shocks and supply disruptions.

Imports of liquefied natural gas (LNG) are expected to supplement conventional supply sources and help stabilize prices. Importing LNG by tankers from foreign sources has the potential to furnish new supplies. Developers have proposed 13 terminals for the West Coast of the United States but, to date, none have been approved in California or Oregon.

LNG tanker loading liquified natural gas at liquefaction plant.
Photo credit: iStockphoto

Location and Capacity of Proposed LNG Terminals in California, Oregon, Washington, Western Canada, and Baja-Mexico - March 2008



Main California and Federal Energy Agencies

California Agencies

California Energy Commission (Energy Commission)
Websites: www.energy.ca.gov, www.gosolarcalifornia.org, www.consumerenergycenter.org
The California Energy Commission is the state's primary energy policy and planning agency. Created by the Legislature in 1974 and located in Sacramento, the Energy Commission has five major responsibilities:

- Forecasting future energy needs and keeping historical energy data.
- Licensing thermal power plants 50 megawatts or larger.
- Promoting energy efficiency through appliance and building standards.
- Developing energy technologies and supporting renewable energy.
- Planning for and directing state response to energy emergency.

With the signing of the Electric Industry Deregulation Law in 1998 (Assembly Bill 1890), the Energy Commission's role includes overseeing funding programs that support public interest energy research; advance energy science and technology through research, development and demonstration; and provide market support to existing, new, and emerging renewable technologies.

California Public Utilities Commission (CPUC)
Website: www.cpuc.ca.gov
The CPUC is a state constitutional agency that regulates privately owned telecommunications, electric, natural gas, water, railroad, rail transit, and passenger transportation companies, in addition to authorizing video franchises. Its five Governor-appointed Commissioners are "dedicated to ensuring that consumers have safe, reliable utility service at reasonable rates, protecting against fraud, and promoting the health of California's economy." Besides regulatory functions, the CPUC over-sees the investor-owned utilities' energy efficiency and rebate programs through the Flex Your Power website (www.FYPower.org) and the California Solar Initiative through its program administrators (www.GoSolarCalifornia.org).

Department of Conservation - Division of Oil, Gas and Geothermal
Website: www.consrv.ca.gov/dog/
The division oversees the drilling, operation, maintenance, and plugging and abandonment of oil, natural gas, and geothermal wells. The regulatory program emphasizes the wise development of oil, natural gas, and geothermal resources in the state through sound engineering practices that protect the environment, prevent pollution, and ensure public safety.

Federal Agencies

U.S. Department of Energy (DOE)
Website: www.energy.gov
The DOE's overarching mission is to advance the national, economic, and energy security of the United States; to promote scientific and technological innovation in support of that mission; and to ensure the environmental cleanup of the national nuclear weapons complex.

Federal Energy Regulatory Commission (FERC)
Website: www.ferc.gov
The Federal Energy Regulatory Commission is an independent agency that regulates the interstate transmission of electricity, natural gas, and oil. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects. The Energy Policy Act of 2005 gave FERC additional responsibilities.

NOTES

For more information
on energy in California
please visit:

www.energy.ca.gov